High Channel Count Time-to-Digital Converter and Lasercom Processor, Phase II



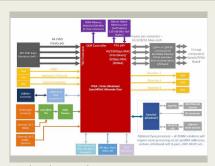
Completed Technology Project (2016 - 2018)

Project Introduction

High-channel-count, high-precision, and high-throughput time-to-digital converters (TDC) are needed to support detector arrays used in deep-space optical communications (DSOC) link receivers being developed between Earth and deep-space solar-system exploration platforms for human and robotic activities in 2020 and beyond. Compared to current radio-frequency (RF) space communications, DSOC will provide 10- to 100-times more data returns for future advanced instruments, live high-definition video, telepresence, and human exploration beyond cislunar space. To be accepted operationally, the optical link must provide substantially greater data rates/data-return volumes than equivalent mass and power RF systems — and at lower cost per bit. Therefore, to prepare for these deep-space missions, substantial enhancement of the current NASA telecom-link capacity is needed. To satisfy NASA's DSOC needs, a scalable high-precision (≤ 100 ps), high-throughput (> 100 Gbps) high-channel-count (≥ 256) time-to-digital advanced processor (HiTAP) architecture will be developed for use in single-photon-counting free-space optical communications systems and test beds. In Phase II, two fully functional systems integrating custom hardware, firmware, and software will be designed, fabricated, tested, and delivered to NASA.

Primary U.S. Work Locations and Key Partners





High Channel Count Time-to-Digital Converter and Lasercom Processor, Phase II

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Small Business Innovation Research/Small Business Tech Transfer

High Channel Count Time-to-Digital Converter and Lasercom Processor, Phase II



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Organizations Performing Work	Role	Туре	Location
Voxtel, Inc.	Lead Organization	Industry	Beaverton, Oregon
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
California	Oregon

Images



Briefing Chart Image

High Channel Count Time-to-Digital Converter and Lasercom Processor, Phase II

(https://techport.nasa.gov/imag e/137050)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Voxtel, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Vinit Dhulla

Co-Investigator:

Vinit Dhulla

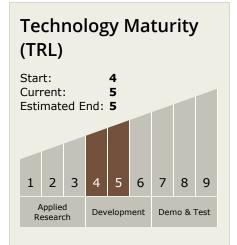


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Technology Areas

Primary:

- **Target Destinations**

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System

